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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,967	03/27/2001	Klaus Lowack	GR 00 P 1582	9883

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EXAMINER
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LAM, CATHY FONG FONG

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 09/08/2003

24

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/817,967

Applicant(s)

LOWACK ET AL.

Examiner

Cathy Lam

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on July 28<sup>th</sup> 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 11, 12, 14, 15 and 24-31 is/are pending in the application.
- 4a) Of the above claim(s) 16-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-12, 14-15, 24-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other:

In view of the amendment filed on July 28<sup>th</sup> 2003, the 112 rejections have been withdrawn. The pending claims, however are continued to be unpatentable as following:

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-12, 14-15, 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ting et al (US 5169680) or Subrahmanyam et al (WO 99/34424).

Ting discloses an electronic component comprised of a substrate (10) and dielectric layers (41,42).

There are two dielectric layers (41,42) formed onto the surface of the substrate. The two dielectric layers are SiO<sub>2</sub> for a lower section (42) and Si<sub>2</sub>N<sub>4</sub> is used for an upper section (41) (col 8 L 43-49 and col 7 L 4-12).

The dielectric layers are selectively metallized on a through hole formed therein or on their surfaces. The through hole and/or the dielectric surfaces are "catalytically treated" or activated before metal is deposited (col 9 L 15-28).

Subrahmanyam also discloses an electronic device comprised of a semiconductor substrate and one or more dielectric layers.

The dielectric layer(s) are deposited over the semiconductor substrate. The dielectric layers can be one or more distinct layers (P. 7 1<sup>st</sup> paragraph). A barrier or

Art Unit: 1775

liner layer is deposited over the dielectric surfaces, prior to metallization step (P. 4 L 12-16).

A precleaning step can be performed both before and after deposition of the barrier layer. The examiner takes the position that having a barrier or liner and precleaning steps are activating the surfaces of the dielectric layer for metallization step (P. 4 L 27- P. 5 L 2).

Both references are silent about the dielectric layers (or insulating layers) thickness. Since applicant has not stated such dielectric thickness range (ie. 0.05-50  $\mu\text{m}$ ) is of any specific use or any advantages, the examiner takes the position that any thickness outside of the claimed range could be activated and/or metallized as desired.

3. Applicant in the latest amendment includes claims 16-23, these claims were agreed to be canceled in the telephonic interview conducted on September 17<sup>th</sup> 2002. It is unclear that why do these claims still exist as "previously added" claims? Applicant is required to cancel these claims when respond to this office action.

### ***Response to Arguments***

4. Applicant's arguments filed on July 28<sup>th</sup> 2003 have been fully considered but they are not persuasive. Applicant disagrees with the art rejections stated in the last office action, and raises the following issues:

A. Ting teaches activating metal layers and not activating insulating layers.

B. Subrahmanyam teaches using Ti or Ti/TiN as a diffusion barrier layer, which are conductive layer not insulating layers. Furthermore, Subrahmanyam does not teach activating an insulating layer or a region of an insulating layer.

In respond to the above issues:

A. Ting teaches a plurality of dielectric layers (11, 27, 26, 42, 41) are formed over the silicon substrate (10). Applicant argues that the via hole metallization (32&14) were formed onto a metal layer NOT an insulating layer.

Ting teaches that the conducting material deposited on an underlying layer which may be a conductor or a **non-conductor**. Ting also stated the two situations with the underlying layer is conductive and the underlying layer is non-conductive (col 3 L 9-19).

The examiner takes the position that if the underlying layer surface is a catalytic surface then the catalytic surface is the activated region in the insulating layer. And if the underlying surface is not catalytically treated then metallization on the underlying surface meets the present invention. In any event, both situations are to illustrate activating an underlying layer which may be a non-conductive material.

B. Subrahmanyam clearly teaches having dielectric layers over a semiconductor substrate. A liner or a barrier layer such as Ti or Ti/TiN is deposited onto the dielectric layer surface before a metal is deposited.

The examiner takes the position that Ti or Ti/TiN is an activation step, and is to provide for subsequence metal deposition. Thus, Ti or Ti/TiN area is the activated region.

5. For the above reasons, claims 11-12, 14-15 and 24-31 are unpatentable and the rejection is sustained.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1775

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (703) 308-2418. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Cathy Lam  
Primary Examiner  
Art Unit 1775

cfl  
September 5, 2003